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| 09/930,219 | 08/16/2001 | Michael Clinton Johnson | D-21, 109 | 9456 |

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PRAXAIR, INC.
LAW DEPARTMENT - M1 557
39 OLD RIDGEBURY ROAD
DANBURY, CT 06810-5113

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| EXAMINER |
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DUONG, THANH P

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| ART UNIT | PAPER NUMBER |
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1764

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/930,219

Applicant(s)

JOHNSON ET AL.

Examiner

Tom P. Duong

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-10 is/are pending in the application.
- 4a) Of the above claim(s) 3-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 8-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Worn (3,041,150). Worn discloses apparatus for effecting catalytic exothermic reaction, comprising (a) shell-and-tube heat exchanger (Fig. 1) comprising a shell inlet (12) and a shell outlet (64) in fluid communication the shell inlet, and further comprising a plurality of tubes each having an inlet and an outlet; a catalyst system (14) comprising a catalyst supported on a monolithic unitary support (48) having passages therethrough, the support having a length and upstream and downstream ends at opposite ends of the length, wherein the diameter of said support from one-half to two times the diameter of the shell of the heat exchanger, and wherein the downstream end of said support is connected in fluid communication with the inlets said tubes (38) by a passageway (36) whose length does not exceed the length of the support and whose diameter is at no point less than the smaller of the diameter said support and the diameter of said shell; wherein the shell outlet of the heat exchanger is connected in fluid communication to the upstream end of the catalyst support; further comprising a gas distributor (54,58)

for distributing gas equally to all catalyst passages of the catalyst support is provided between the shell outlet and the upstream end of the catalyst support, and a gas to be reacted is in fluid communication with said shell inlet (12). With respect to the catalyst supported on a monolithic unitary support, it is well-known in the art to provide a catalyst on a monolithic support such as a honeycomb structure in order to provide adequate support to the catalyst layer. Note, the use of the apparatus for gas purification lacks patentable weight in an apparatus claim. Apparatus must be distinguished from the prior art in terms of structure rather than function. See *In re Schreider*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1977).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Worn '150. Worn discloses apparatus for effecting catalytic exothermic reaction, comprising (a) shell-and-tube heat exchanger (Fig. 1) comprising a shell inlet (12) and a shell outlet (64) in fluid communication the shell inlet, and further comprising a plurality of tubes each having an inlet and an outlet; a catalyst system (14) comprising a catalyst

supported on a monolithic unitary support (48) having passages therethrough, the support having a length and upstream and downstream ends at opposite ends of the length, wherein the diameter of said support from one-half to two times the diameter of the shell of the heat exchanger, and wherein the downstream end of said support is connected in fluid communication with the inlets said tubes (38) by a passageway (36) whose length does not exceed the length of the support and whose diameter is at no point less than the smaller of the diameter said support and the diameter of said shell; wherein the shell outlet of the heat exchanger is connected in fluid communication to the upstream end of the catalyst support; further comprising a gas distributor (54,58) for distributing gas equally to all catalyst passages of the catalyst support is provided between the shell outlet and the upstream end of the catalyst support, and a gas to be reacted is in fluid communication with said shell inlet (12). With respect to the catalyst supported on a monolithic unitary support, it is well-known in the art to provide a catalyst on a monolithic support such as a honeycomb structure in order to provide adequate support to the catalyst layer. Note, the use of the apparatus for gas purification lacks patentable weight in an apparatus claim. Apparatus must be distinguished from the prior art in terms of structure rather than function. See *In re Schreider*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1977). Worn discloses a first catalyst system and a first gas distributor as described above, but fails to disclose a second catalyst system and a second gas distributor as claimed. However, it would have been *prima facie* obviousness to provide additional catalyst system(s) coupled with additional gas distributor(s) to increase the efficiency of the reactor and it would have been

obvious to do so here. Note, the court held that mere duplication of parts has no patentable significance unless a new unexpected result is produced. See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

3. Claims 1 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over prior art Admission in view of Worn '150. Admission discloses an apparatus (Figure 1) useful for purifying a gas stream, comprising (a) shell-and-tube heat exchanger (102) comprising shell inlet (101) and a shell outlet in fluid (107) communication with the shell inlet, and further comprising a plurality of tubes (tubes inside 102) each having an inlet and an outlet and an outlet; and the first outlet (feed line between heater 103 and catalyst vessel 104) of the heat exchanger is connected fluid communication upstream end the catalyst support (catalyst support in vessel 104). Admission fails to disclose a catalyst system comprising a catalyst supported monolithic unitary support having passages therethrough, the having a length and upstream opposite ends of the length, of said support is from one-half two times diameter of the exchanger, and wherein the downstream end is connected in fluid communication with inlets tubes by a passageway whose length does exceed length of the support and whose diameter is no point less than the smaller of the diameter of said support and diameter said shell; and a source of gas be purified fluid said upstream end said support; wherein the shell outlet of the heat exchanger is connected in fluid communication to the upstream end of the catalyst support; further comprising a gas distributor for distributing gas equally to all catalyst passages of the catalyst support is

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provided between the shell outlet and the upstream end of the catalyst support, and a gas to be reacted is in fluid communication with said shell inlet. Worn '150 teaches an apparatus for catalytic reaction (Fig. 1), comprising: a shell-and-tube heat exchanger comprising a catalyst supported on a monolithic unitary support (14), which is integrally built-in with the shell and tube exchanger. The support has a length with upstream and downstream ends opposite ends of the length, and downstream end of said support is connected in fluid communication with the inlets of said tubes (38) passageway (36) whose length does not exceed the length support and whose diameter is at point less the diameter of said and the diameter of said support is from one-half to two times of the shell of the heat exchanger and the fluid gas (12) to be reacted in fluid said upstream end of said support wherein the shell outlet of the heat exchanger (18) is connected in fluid communication to the upstream end (38) of the catalyst support; further comprising a gas distributor (54,58) for distributing gas equally to all catalyst passages of the catalyst support is provided between the shell outlet and the upstream end of the catalyst support, and a gas to be reacted is in fluid communication with said shell inlet. Thus, it would have been obvious in view of Sworn to one having ordinary skill in the art to modify the apparatus of prior art Admission with a catalyst system integrally built-in with the heat exchanger in order to minimize piping cost, installation cost, and space. Note, the use of a one piece construction instead of the structure disclosed in [prior art] would merely a matter of obvious engineering choice (See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCP A 1965)). Admission in view of Worn discloses a first catalyst system and a first gas distributor as described above, but fails to disclose a

second catalyst system and a second gas distributor as claimed. However, it would have been *prima facie* obviousness to provide additional catalyst system(s) coupled with additional gas distributor(s) to increase the efficiency of the catalytic reactor and it would have been obvious to do so here. Note, the court held that mere duplication of parts has no patentable significance unless a new unexpected result is produced. See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). With respect to the catalyst supported on a monolithic unitary support, it is well-known in the art to provide a catalyst on a monolithic support such as a honeycomb structure in order to provide adequate support to the catalyst layer.

Response to Arguments

Applicant's arguments with respect to claims 1-2 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not


mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong
May 19, 2005
TD *TD*


Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700